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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/528,832

03/23/2005

Valerio Tognazzo

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EXAMINER

WU, IVES J

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

02/04/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/528,832

Applicant(s)

TOGNAZZO, VALERIO

Examiner

Ives Wu

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28, 30, 31 and 58-74 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 8, 10, 11 and 58-74 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 6, 7, 9, 12-28, 30, 31, 58 and 68 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/23/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

(1). Applicant's election without traverse of claims 1-31 in the reply filed on 11/27/2008 is acknowledged.

Claims 29, 32-57 are cancelled. New claims 58-74 are added.

Claim Objections

(2). **Claim 58** is objected to because of the following informalities: In claim 58, it recites: at not least than 1200 °C". It would be "at not **less** than 1200 °C". Appropriate correction is required.

Claim 68 is objected to because of the following informalities: In claim 68, it recites: at least one water film". It would be "at least one water **film**". Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(3). **Claims 1-2, 5, 58-74** are rejected under 35 U.S.C. 103(a) as being unpatentable over Starr et al "The capture of airborne particles by water drops and simulated snow crystals", *Quart. J. Roy. Meteor. Soc.* 92:490 (1966), in view of Haruch (US04343434) and Tognazzo (US05310411A).

As to step of subjecting a stream of pollutant-containing fumes or gases to a sprinkle wash by unpolluted water within a snow producer and subjecting the water, during its passage, to rapid cooling to a temperature sufficient to transform it into snow flakes which along their path collect the pollutants present in the stream of fumes or gases in a process in **independent claim 1**, Starr et al "The capture of airborne particles by water drops and simulated snow crystals" disclose the capture of particulate matter by falling raindrops and snowflakes to be important in the removal of industrial pollutants, radioactive debris, biological organisms and dust from atmosphere. The physics of the problem is also relevant to the suppression of dusts by water sprays and the functioning of spray towers. The experiment now to be described was designed to measure the collection efficiency of simulated snow crystals for solid particles a few microns in radius (Introduction, 1st, 2nd paragraphs). Water drops from microburette, An approach their terminal velocities while falling through the glass tube B, and then enter the tube C which is filled with cloud of particles (page 451, 3rd paragraph), which reads on the sprinkle wash by unpolluted water as claimed because the polluted water would not provide accurate results. Starr et al "The capture of airborne particles by water drops and simulated snow crystals" **do not teach** the snow making by rapid cooling as claimed.

However, Haruch (US04281518) **teach** air efficient atomizing spray nozzle (Title). Thus, when this nozzle is utilized for making snow the chosen spray pattern exits from the nozzle orifice and freezes immediately into minute ice crystals (Col. 6, line 8-11).

The advantage of making snow by atomizing nozzle is the ability to operate effectively without the addition of pressurized air, or to use as much, or as little air, as necessitated by the degree of atomization desired, from relative coarse spray particle size afforded by straight hydraulic operation, to the very fine atomized spray particles afforded by added air atomization – wide range of size is controllable (Col. 2, line 3-9).

Therefore, it would have been obvious at time of the invention to carry out experiments of Starr et al by making snow in the spray tower disclosed by Haruch to get advantage cited above.

As to step of discharging from snow producer said snow flakes being reached the base in **independent claim 1**, it would have been obvious to have outlet for discharging in the devices such as spray tower based on continuous operation of engineering practice.

As to step of feeding the resultant polluted water derived from snow flakes to a gasifier in **independent claim 1**, Starr et al "The capture of airborne particles by water drops and simulated snow crystals" **do not teach** the gasifier as claimed.

However, Tognazzo (US05310411A) **teaches** the process and machine for the transformation of combustible pollutants of waste materials into clean energy and usable products (Title). An aim is to optimize the gasification method.

The advantage of gasification is to transform combustible pollutants or waste materials into clean energy and utilizable products (Col. 1, line 8-10, 35-41).

Therefore, it would have been obvious at time of the invention to install the gasification device of Tognazzo in the spray tower of Starr et al in order to obtain the cited advantage.

As to process for ultra-purifying fumes or gases with total recovery of the resultant pollutants in **independent claim 1**, the intended use is not to be considered as limitation and of no significance in the claim construction. "A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and prior art in order to patentably distinguish the claimed invention from prior arts. If the prior art structure is capable performing the intended use, then it meets the claim". MPEP §§ 7.37.09.

As to feed an ascending stream of fumes or gases into snow producer in **claim 2**, Starr et al "The capture of airborne particles by water drops and simulated snow crystals" disclose ejecting particles into the column C, which would be ascending because the natural diffusion of the gas.

As to wash water temperature not greater than 0°C in **claim 5**, in absence of showing the criticality of the records, the optimized temperature of wash water to be not greater than 0°C in such known process renders prima facie obviousness within one of ordinary skills in the art. In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).

As to the gasifier in **independent claim 58**, Tagnazzo (US05310411A) discloses a machine characterized by comprising: a thermic lance disgregator operating in absence of air and

at a temperature higher than 1600 °C. The whole decomposition of the material to be treated into combustible gases based on H₂ and CO, non-combustible gases and inerts, a water separator to suddenly cool together all the products thus decomposed and to separate the inert products with water, thus generating steam and reducing the gases temperature at not less than 1200 °C., a filter-thermoreactor containing a depurative carbonaceous mass heated at a temperature higher than 1200 °C., said filter-thermoreactor being connected to said disgregator and to said separate to remove the residual pollutants from the gases and to transform them, at least in part, into hydrogen, carbon monoxide and other wholly utilizable gaseous products, and a refrigerator for said gaseous products coming out from said filter-thermoreactor (Col. 2, line 11-33).

As to heat coming from various cooling phases being used to pre-heat the material to be treated and bring it to the correct content of humidity in **claim 59**, Tagnazzo (US05310411A) discloses to apply the heat coming from various cooling phases to pre-heat the material so as to bring material to the predetermined content of humidity (Col. 7, line 44-46).

As to material to be treated being compressed before being submitted to the action of the thermic lance in **claim 60**, Tagnazzo (US05310411A) discloses to compress the material before introducing material to thermic lance (Col. 7, line 48-49).

As to compression of the material to be treated being obtained by forcing the passage of material through the entry aperture to the decomposition chamber in **claim 61**, Tagnazzo (US05310411A) discloses to compress the material including forcing material through an entry aperture into a decomposition chamber (Col. 7, line 51-53).

As to a thermic decomposition of the material to be treated being carried out by an oxyhydrogen flame in **claim 62**, Tagnazzo (US05310411A) discloses the thermic decomposition of the material being carried out by an oxyhydrogen flame of the thermic lance (Col. 7, line 58-60).

As to material to be treated being passed several times through the oxyhydrogen flame in **claim 63**, Tagnazzo (US05310411A) discloses the compressed material going through the neck 24, thanks to the particular shape of the oxyhydrogen flame 2 obtained by the inclination of the alimentary pipes, undergoes four decomposition, the 1st at the flame head and the 2nd, third and fourth at the tail, as shown in the Figure 2 by broken line (Col. 5, line 8-13).

As to the covering of the bottom of the decomposition chamber to be protected by previously decomposed material during the thermodecomposition of the material to be treated in **claim 64**, Tagnazzo (US05310411A) discloses a bottom of the decomposition chamber to be protected by previously decomposed material during the thermic decomposition of the material (Col. 7, line 54-57).

As to water used in the cooling process to be superficially invested by the thermodecomposed products to be cooled in **claim 65**, Tagnazzo (US05310411A) discloses water used in the cooling process being superficially contacted by the thermally decomposed products to be cooled (Col. 7, line 61-63).

As to all the inert products to be collected at a single zone in **claim 66**, Tagnazzo (US05310411A) discloses all the inert products being collected at a single zone (Col. 7, line 64-65).

As to heat from the thermic lance to be recovered to transform gases from the thermic decomposition and separation phases of the inert product into combustible gases in **claim 67**, Tagnazzo (US05310411A) discloses heat from the thermic lance to be recovered to transform gaseous products from the thermic decomposition and separation phase of the inert products into combustible gaseous products (Col. 7, line 66 – Col. 8, line 2).

As to combustible gases to be stabilized and purified by passing them through at least one water film in **claim 68**, Tagnazzo (US05310411A) discloses the combustible gaseous products to be stabilized and purified by passing combustible gaseous products through at least one water film (Col. 8, line 3-6).

As to carbon monoxide to be converted with steam into hydrogen and carbon monoxide in the presence of catalysts in **claim 69**, Tagnazzo (US05310411A) discloses carbon monoxide to be converted with steam into hydrogen and carbon dioxide in the presence of catalysts (Col. 8, line 7-9).

As to catalysts to be $\text{Fe}_2\text{O}_3\text{--Cr}_2\text{O}_3$ in **claim 70**, catalysts to be $\text{Cu-ZnO-Al}_2\text{O}_3$ in **claim 71**, Tagnazzo (US05310411A) discloses $\text{Fe}_2\text{O}_3\text{--Cr}_2\text{O}_3$, $\text{Cu-ZnO-Al}_2\text{O}_3$ used as catalysts (Col. 8, line 10-13).

As to carbon dioxide to be frozen to obtain dry ice in **claim 72**, Tagnazzo (US05310411A) discloses to freeze the carbon dioxide to obtain dry ice (Col. 8, line 14-15).

As to hydrogen to be submitted to a purifying phase in **claim 73**, Tagnazzo (US05310411A) discloses the hydrogen to be introduced to a purifying phase (Col. 8, line 16-17).

As to hydrogen to be used to power a fuel cell in **claim 74**, Tagnazzo (US05310411A) discloses hydrogen to be used to power a fuel cell (Col. 8, line 18-19).

(4). **Claims 8, 10-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Starr et al "The capture of airborne particles by water drops and simulated snow crystals", *Quart. J. Roy. Meteor. Soc.* 92:490 (1966), in view of Haruch (US04343434) and Tognazzo (US05310411A), further in view of Müller et al (US04281518), further evidenced by Fukuta (US5628455A).

As to rapidly cooling unpolluted water with a stream of cold gas injected into snow producer in **claim 8**, liquid nitrogen in **claim 11**, Haruch (US04343434) disclose immediately freezing to make snow by nozzle (Col. 6, line 8-12). Starr et al and Haruch **do not teach** a stream of cold gas used for rapidly cooling as claimed.

However, Müller et al (US04281518) **teach** to form snow by liquid inert gas such as liquid nitrogen (Abstract, Col. 2, line 47-51).

The advantage of using liquid inert gas for the coolant is to cool these components in the gas moisture to go into a solid state such as snow (Col. 1, line 47-49).

Therefore, it would have been obvious at time of the invention to apply the liquid inert gas disclosed by Müller et al for the freezing to make snow taught by Haruch in the spray tower disclosed by Starr et al in order to attain the advantage cited above.

As to a stream of liquid carbon dioxide in **claim 10**, it is well known in the art that liquid carbon dioxide is also a liquid inert gas to be used as coolant evidenced by Fukuta (US05628455A).

Allowable Subject Matter

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(5). **Claims 3-4, 6-7, 9, 12-28, 30-31** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

Art Unit: 1797

Date: January 25, 2008

DUANE SMITH
PRIMARY EXAMINER

DS
2-1-08